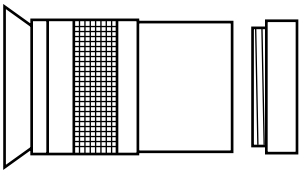
Meade® Series 4000™ Photo-Visual Color Filters

For increased contrast and resolution of the Moon and planets in visual or photographic applications.

Color filters are an essential tool of the lunar and planetary observer, for filters permit the observation and photography of surface detail that is often virtually invisible without filtration.

Filters solve, or greatly reduce the effects of, two basic observing problems: (a) Irradiation is the fuzzying of a boundary between lighter and darker areas of the Moon or a planetary surface and can be caused either by the effects of highly contrasting light impacting the human eye or by the motion of the Earth's atmosphere, through which the observation is being made. (b) Contrast is the separation of adjacent surface regions according to their color; for example, a light green area on Mars can become mixed in the eye with an adjacent light yellow area, to the effect that the combined area appears yellow-green, unseparated into its component regions.



Series 4000 filters thread into the barrels of virtually all 1.25" eyepiece brands.

The use of a Meade Series 4000 color filter can mean the difference between seeing small craterlets in the floor of Clavius on the Moon and not; it can mean the difference between seeing five or six whirls, festoons, and loops in Jupiter's north equatorial belt and seeing one or two; it can mean the difference between seeing the inner crépe ring of Saturn and not. Depending on atmospheric conditions on both the Earth and the planet being observed, the advantages of color filters can be anywhere from subtle to dramatic.

Meade Series 4000 filters are a large 26mm in clear aperture and are manufactured from the purest crown optical glass, dyed-in-the-mass (*not* "color coated"); there are no finer filters available for telescopic applications.

Each filter glass is anti-reflection coated on both sides and is mounted in a machined aluminum cell with the Wratten No. of the filter marked on the side of the cell. Filters may be piggybacked, or stacked, to achieve selective filtration of the visual color spectrum.

For visual applications Series 4000 filters thread into the barrels of all Meade 1.25" eyepieces, and into the barrels of virtually all other 1.25" eyepiece brands as well. The eyepiece-with-filter can be placed in the eyepiece-holder of a Schmidt-Cassegrain telescope or Meade *ED* Apo-chromatic Refractor for Tele-Extender eyepiece-projection photography *(p. 103)* of the Moon and planets. The filters also thread into the barrels of the Meade Camera Adapter (1.25") and Variable-Projection Camera Adapter, p. 103.

Each Series 4000 filter is packed in a foam-fitted plastic case for secure long-term storage. Filters may be purchased either individually or in sets of 4, as noted.

Recommended Series 4000 Filter Applications

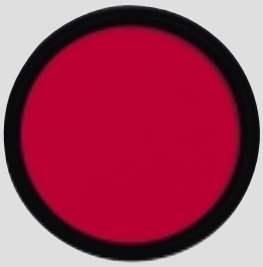
#8 Light Yellow *(83% transmission):* Useful in observing red and orange-colored phenomena in the belts of Jupiter and in enhancing the level of observable detail of small orange-red zonal features within the belts of the planet. Increases contrast of maria on Mars. Can result in improved resolution of dusky detail on Uranus and Neptune in instruments of 10" aperture and larger. A popular filter for the enhancement of lunar features, particularly in telescopes of 8" aperture and smaller.

#11 Yellow-Green *(78% transmission):* Contrasts well with the red and blue characteristics of surface features on Jupiter and Saturn. Darkens the maria visible on Mars, and clarifies the Cassini division in Saturn's rings.

#12 Yellow *(74% transmission):* Contrasts strongly with blue-colored features on Jupiter and Saturn, while enhancing red and orange features. Lightens red-orange features on Mars, while reducing or blocking the transmission, and thereby increasing the contrast, of blue-green areas. Useful in increasing the contrast of lunar features in telescopes 6" aperture and larger.

#21 Orange *(46% transmission):* Reduces or blocks transmission of blue-green wavelengths. Use on Jupiter and Saturn to enhance detail in the belts and polar regions. Sharpens boundaries between yellow-orange areas and blue-green regions on Mars, resulting in a darkening of edge-detail in the maria.

#23A Light Red *(25% transmission):* On telescopes of 6" aperture and larger the #23A does approximately the same functions as the #21 filter, but with stronger contrast and enhancement of marginally defined blue-green surface detail. Useful primarily on Jupiter, Saturn, and Mars. Increases contrast between Mercury and bright blue sky during daylight observations or during twilight.



#25A Red *(14% transmission):* The #25A filter strongly blocks the transmission of blue and blue-green wavelengths, resulting in very sharply defined contrast between, for example, blue-tinted cloud formations on Jupiter and the lighter-toned features of the disc. Also useful for the delineation of the Martian polar ice caps and maria. Because of its relatively low total light transmission the #25A filter should be employed on telescopes of 8" aperture and larger.

#38A Dark Blue *(17% transmission):* A popular filter for the study of Jupiter's disc, owing to the filter's strong rejection of orange and red wavelengths. Increases contrast between the reddish belt structures and enhances detail of the Red Spot. Also useful for the study of isolated phenomena, such as dust storms, on Mars, as well as the belt structure of Saturn. Increases contrast of subtle cloud markings on Venus.

#47 Violet *(3% transmission):* Strongly rejects red, yellow, and green wavelengths; useful for the study of Martian polar cap regions and for the observation of occasional phenomena in the upper atmosphere of Venus. Enhances contrast between the rings of Saturn. Use only on telescopes of 8" aperture and larger.

#56 Light Green *(53% transmission):* Excellent for the observation of Martian polar ice caps as well as yellow-tinted dust storms on the Martian surface. Increases contrast of the red and blue regions in Jupiter's atmosphere as well as in the cloud belts. Also useful for enhancing lunar detail.

#58 Green *(24% transmission):* Use on telescopes 8" aperture and larger to reject blue- and red-toned structures on the surface of Jupiter and thereby increase their contrast relative to lighter parts of the disc. Also use for the enhancement of Saturn's cloud belts and polar regions. Strongly increases contrast of Mars' polar ice caps, and increases contrast of atmospheric phenomena on Venus.

#80A Blue *(30% transmission):* A popular filter for the study of Jupiter and Saturn. Enhances contrast of rilles and festoons in Jupiter's cloud belts, as well as details of the Red Spot. Brings out detail in Saturn's belts and polar phenomena. Very useful as a contrast-enhancing lunar filter.

#82A Light Blue *(73% transmission):* Useful on the Moon, Mars, Jupiter, and Saturn, this subtle pale blue filter enhances areas of low contrast while avoiding significant reduction of overall image brightness. A valuable filter to piggyback with other filters.

ND 96 Moon Filter *(0.9 density; 13% transmission):* The neutral density filter transmits light uniformly across the entire visual spectrum. It serves as an excellent filter to reduce glare and irradiation when observing the Moon with any telescope 4" and larger. The ND96 filter may also be employed in the splitting of close double stars where one of the binary pair significantly exceeds the other in brightness.

Meade Series 4000 Photo-Visual Color Filters may be ordered individually or in the following sets:

Set #1 (4 filters): #12 Yellow; #23A Light Red; #58 Green; #80A Blue.

Set #2 (4 filters): #11 Yellow-Green; #25A Red; #47 Violet; #82A Light Blue.

Set #3 (4 filters): #8 Light Yellow; #21 Orange; #38A Dark Blue; #56 Light Green.

#905 Variable Polarizing Filter (1.25")—For glare-reduction in observing the Moon the #905 Variable Polarizer includes two Polarizer filters mounted in a specially-machined cell. The #905 permits variable settings of the light transmission between 5% and 25%, to account for varying lunar surface brightness according to the phase of the Moon and the magnification and aperture of the telescope. Accepts 1.25" eyepieces.